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TABLE III

Diet	Weight—First 25 Days		Weight—Follow- ing 55 Days		Total Weight In- crease, Per Cent. ³
	In- crease, Per Cent.	De- crease, Per Cent.	In- crease, Per Cent.	De- crease, Per Cent.	
Meat	43	—	86	—	129
Sugar	15	—	55	—	70
Sugar and vita- mine ⁴	15	—	145	—	160
Starch	6	—	62	—	68
Starch and vita- mine ⁴	6	—	165	—	171
Lard	—	9	—	8	-17
Lard and vita- mine ⁴	—	9	34	—	25

The rats on the protein diet did not require the addition of extra vitamine (autolyzed yeast) at all. This may be regarded as the "sparing action of protein on the vitamine requirement." On the other hand, the rats on the fat diet took the extra vitamine with great avidity, but showed only a small advantage over the controls. The replacement of some of the fat by butter was without any significance, no improvement being noted.

On the starch diet, the rats actually needed extra vitamine (about 2 c.c. per day) in order to resume growth. This was likewise true of the rats on the sugar diet except that they appeared not to require as much vitamine for growth as those on the starch diet. On these diets we occasionally observed sudden large increases and losses in weight, suggestive of edema, though no external evidence was seen. As regards the general appearance of the animals, those on the protein diet and those getting extra vitamine looked very healthy, while the others appeared to be in poor shape with the usual evidences of improper nutrition. The rats on the high fat diet, without extra vitamine, presented the poorest appearance.

Out of thirty rats, only one developed keratomalacia, and this rat was getting five per cent. cod-liver oil. The eye condition cleared

³ In this instance, the figure represents the increase after 60 days, and is practically the same after 80 days, since most of the animals had already attained full size.

⁴ Vitamine given during last 55 days.

up on giving autolyzed yeast (about 2 c.c. per day).

The findings reported here show conclusively that although the qualitative food requirements of a well balanced diet have been pretty well established, this can not be said of the quantitative relationship between the dietary constituents necessary for proper nutrition. It is quite conceivable that under the abnormal conditions existing during the war period and after, the usual ratio between the protein, carbohydrate, and vitamine constituents have been so changed as to present conditions analogous to those described by us in rats.

Theoretically at least, the above conditions could be corrected in either of two ways—(a) by increasing the protein and decreasing the carbohydrate intake, or (b) by supplying extra vitamine. The curative experiments of edema in rats reported by Miss Kohmann, and also the condition described as pellagra in a monkey, by Miss Chick, may be viewed in the above light. In view of the complications presented by the "sparing action of animal protein on the vitamine requirements," it may be just as well for the present to leave the question open, as to whether or not pellagra and war edema are avitaminoses. Of all the theories regarding pellagra, that expressed by Goldberger in which he states the facts and leaves the matter open for further investigation, appears to us to be the most satisfactory.

Our complete results will be published in detail later on.

CASIMIR FUNK,
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